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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,800	01/24/2004	Larry S. Eoff	2003-IP-009464U1	1654

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Robert A. Kent
Halliburton Energy Services
2600 South 2nd Street
Duncan, OK 73536-0440

EXAMINER

FIGUEROA, JOHN J

ART UNIT	PAPER NUMBER
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1712

DATE MAILED: 03/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/763,800

Applicant(s)

EOFF ET AL.

Examiner

John J. Figueroa

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1712

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-98 is/are pending in the application.
- 4a) Of the above claim(s) 6-9, 15-20, 22, 23 and 30-98 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 10-14, 21 and 24-29 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 8 Total: 1/04-3/06.
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. 03132006.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-14, 21-29 and 56-61, drawn to a method of performing an injection operation including introducing a relative permeability modifier (RPM) comprising a hydrophobically modified water-soluble polymer (claim 2), classified in class 507, subclass 110.
 - II. Claims 15-20, drawn to a method of performing an injection operation including a hydrophobic polymer and a surfactant, classified in class 516, subclass 53+.
 - III. Claims 30-44 and 51-55 drawn to a method of performing an injection operation including a hydrophilically modified water-soluble polymer, classified in class 507, subclass 117+.
 - IV. Claims 45-50, drawn to a method of performing an injection operation including a hydrophilic polymer and a surfactant, classified in class 516, subclass 53+.
 - V. Claims 62-98, drawn to a permeability-modifying injection fluid, classified in class 507, subclass 138.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions V and (I-IV) are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1)

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the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product. See MPEP § 806.05(h). In the instant case, in addition to using the aqueous fluid containing the recited water-soluble polymer for modifying surface permeability in methods of fracturing a formation, said aqueous fluid can instead be used as an aqueous viscosifying composition to provide, e.g., a fluid-loss additive in a method of completion/cementing a well bore.

3. Inventions I and II are directed to related methods of use. The related inventions are distinct if the inventions as claimed do not overlap in scope, i.e., are mutually exclusive; the inventions as claimed are not obvious variants; and the inventions as claimed are either not capable of use together or can have a materially different design, mode of operation, function, or effect. See MPEP § 806.05(j). In the instant case, each of the methods of use involves injecting a composition containing a hydrophobically modified polymer. However, the composition recited in the Group II claims further requires a surfactant. The composition in Group II can thus be an emulsion, which is patently distinct from the composition claimed in Group I.

4. Inventions III and IV are directed to related methods of use. The related inventions are distinct if the inventions as claimed do not overlap in scope, i.e., are mutually exclusive; the inventions as claimed are not obvious variants; and the inventions as claimed are either not capable of use together or can have a materially different design, mode of operation, function, or effect. See MPEP § 806.05(j). In the instant case, each of the methods of use involves injecting a composition containing a

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hydrophilically modified polymer. However, the composition recited in the claims of Group IV further requires a surfactant. The composition in Group IV can thus be an emulsion, which is patently distinct from the composition claimed in Group III.

5. Inventions I-II and III-IV are directed to related methods of use. The related inventions are distinct if the inventions as claimed do not overlap in scope, i.e., are mutually exclusive; the inventions as claimed are not obvious variants; and the inventions as claimed are either not capable of use together or can have a materially different design, mode of operation, function, or effect. See MPEP § 806.05(j). In the instant case, the methods of injecting a composition involve compositions having patentably distinct water-soluble polymers. In Groups I and II, the water-soluble polymer is a *hydrophobically* modified copolymer, whereas in Groups III and IV, said polymer is instead a *hydrophilically*-modified copolymer.

6. Because these inventions are independent or distinct for the reasons given above and have acquired a separate status in the art in view of their different classification, and further require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

7. This application contains claims directed to the following patentably distinct species for the hydrophilic polymer component of the water-soluble polymer: dimethylamino pendant group, alkyl acrylate, cellulose, chitosan, polyamide, etc. The species are independent or distinct because of distinct classification (and search) of the distinct functional groups of the various monomers.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claim 5 is generic.

As discussed below, Applicant has elected chitosan as the species to be examined. Accordingly, claims 6-9, 22, 23 and 56-61 have been withdrawn as drawn to a distinct species of the hydrophilic polymer component.

Upon the allowance of a generic claim, Applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141. If claims are added after the election, Applicant must indicate which are readable upon the elected species.

MPEP § 809.02(a).

8. During a telephone conversation with Mr. Robert A. Kent on March 8, 2006, a provisional election was made without traverse to prosecute the invention of Group I, claims 1-14 and 21-29, and also elected "chitosan" as the species to be examined for the hydrophilic polymer component as mentioned previously.

Affirmation of this election must be made by Applicant in replying to this Office action. Claims 15-20 and 30-98 are withdrawn from further consideration by the Examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention. Moreover, claims 6-9, 22-23 and 56-61 are currently withdrawn as drawn to non-elected species.

9. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim

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remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Double Patenting

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 1-11, 14, 21-29 and 56-61 are rejected on the ground of nonstatutory double patenting over claims 1-6 and 13-18 of U. S. Patent No. 6,476,169 since the

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claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows: the claims in both patents are drawn to a method of treating a subterranean formation to alter the permeability of the formation by introducing (e.g., injecting) a hydrophobically modified hydrophilic polymer as an RPM.

12. Claims 1-14 and 21-29 and 56-61 are provisionally rejected on the ground of nonstatutory double patenting over claims 1-16, 35-54 and 77-112 of copending Application No. 10/760,443. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: both sets of claims are drawn to a method of treating a subterranean formation by providing (injecting) an RPM containing a hydrophobically modified water-soluble polymer. Particularly, the method of the instant claims and that of claims 35-54 and 77-112 of the '443 application both recite injecting a fluid including the RPM into the formation.

13. Claims 1-14, 21-29 and 56-61 are provisionally rejected on the ground of nonstatutory double patenting over claims 1-45 of copending Application No.

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10/780,995. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: both sets of claims are drawn to a method of treating a subterranean formation comprising introducing (e.g. injecting) a RPM containing a hydrophobically modified water-soluble polymer.

14. Claims 1-14, 21-29 and 56-61 are provisionally rejected on the ground of nonstatutory double patenting over claims 1-55 of copending Application No.

10/806,894. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: both sets of claims encompass a method of treating a subterranean formation by providing (e.g., injecting) an RPM containing a hydrophobically modified water-soluble polymer.

15. Claims 1-12, 14, 21-29 and 56-61 are provisionally rejected on the ground of nonstatutory double patenting over claims 1-24 of copending Application No.

10/825,001. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: both sets of claims are drawn to a method of treating a subterranean formation comprising introducing (e.g. injecting) a RPM containing a hydrophobically modified water-soluble polymer.

16. Claims 1-14, 21-29 and 56-61 are provisionally rejected on the ground of nonstatutory double patenting over claims 1-35 of copending Application No.

10/862,132. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented. Both sets of claims are drawn to a method of treating a subterranean formation by contacting (e.g., injecting) a RPM containing a hydrophobically modified water-soluble polymer.

17. Claims 1-14, 21-29 and 56-61 are provisionally rejected on the ground of nonstatutory double patenting over claims 1-27 of copending Application No.

10/893,210. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: both sets of claims are drawn to a method of treating a subterranean formation, such as a well bore, comprising

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introducing (e.g. injecting) a RPM containing a hydrophobically modified water-soluble polymer.

18. Claims 1-14, 21-29 and 56-61 are provisionally rejected on the ground of nonstatutory double patenting over claims 1-19 of copending Application No.

11/122,836. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: both sets of claims are drawn to a method of treating a subterranean formation comprising introducing (e.g. injecting) a RPM containing a hydrophobically modified water-soluble polymer.

Information Disclosure Statement

19. The information disclosure statement filed January 23, 2004, April 15, 2005 and June 6, 2005 listed documents from that were cited in another IDS filed with this application. The documents that were cited elsewhere in other submitted IDS have been crossed out on the corresponding PTO-1449 form.

Examiner notes that USPN 3,451,818, which was cited on the PTO-1449 form filed on April 15, 2005, although considered, is drawn to a completely different technology and is not relevant to the claimed invention.

Claim Rejections - 35 USC § 112

20. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

21. Claims 2-14 and 21-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 2, 3, 5 and 21 recite the limitation "hydrophobically modified water-soluble polymer." There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

22. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

23. Claims 1-5, 10, 12, 14, 21 and 24-29 are rejected under 35 U.S.C. 103(a) as being anticipated by United States Patent Number (USPN) 4,532,052 to Weaver et al. (hereinafter 'Weaver').

Weaver discloses a method for treating a subterranean formation to substantially alter the fluid flow and/or surface characteristics of the formation, said method including injecting into the formation a composition comprising a branched water-soluble organic polymer containing units that can be hydrophilic, hydrophobic or combinations thereof

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and that have a molecular weight of 900 to 50,000,000. (Abstract; col. 5, lines 30-65; col. 6, lines 29-65; col. 7, lines 7-33; col. 9, lines 49-63; col. 20, line 65 to col. 21, line 6)

The branched polymer can have, in its backbone chain and/or in its branch chain, one or more heteroatom or groups, such as nitrogen, oxygen, phosphorous, sulfur, sulfur groups, amide, carboxyamide and carbonyl. (Col. 14, lines 17-23 and 52-59) The polymer units in either chain can be $-R-X-$, wherein R is a C_1 to C_6 alkyl radical and X represents a heteroatom. (Col. 19, lines 41-65)

Weaver discloses a list of monomers, including dimethylaminoethyl methacrylate, that can be used to form the branched polymers and further discloses that the branched chain can be a polymeric unit/group, such as a saccharide or a derivative thereof (including cellulose and starch), an amide or an ether, as long as it has the desired hydrophilic-hydrophobic property. (Col. 19, lines 7-10; col. 19, line 66 to col. 20, line 29; col. 22, lines 47-65) The saccharide and saccharide derivative units (Class V) are represented by the chemical structure depicted on col. 25-26, lines 43-59. (See *also*, the examples on col. 35-36)

In Procedure O beginning on col. 50, line 5, Weaver discloses an example of altering the permeability of a formation surface (change in water-oil ratio) by injecting into the formation a copolymer of polydimethylaminoethyl methacrylate (PDMAEM having MW of 1 million) grafted with a polyethylene oxide branch (PEO, MW of 15,000). The resulting data showing reduction in water permeability of the formation is shown in Tables 7 and 8. (See *also* Tables 10-13 on col. 57-59 for permeability data of an aqueous treating solution containing 1% of a hydrophilic PDMAEM polymer (MW of

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600-800K) branched with a hydrophobic methoxy-polyethylene glycol epichlorohydrin (MPEO) adduct). In Tables 14-15 on col. 59, Weaver further discloses PDMAEM:PEO/MPEO weight ratios for the branched polymer ranging from 0.5:1.0 to 1.25 to 0.25.

Thus, the claims are anticipated by Weaver.

Claim Rejections - 35 USC § 103

24. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

25. Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weaver in view of USPN 6,358,889 B2 to Waggenpack et al (hereinafter 'Waggenpack').

Weaver was discussed above. Although Weaver discloses the hydrophilic backbone polymer to be a saccharide, such as cellulose or starch, Weaver does not specifically disclose chitosan (a cellulose-type derivative) as the hydrophilic backbone polymer chain of the branched water-soluble copolymer.

On the other hand, Waggenpack teaches well drilling and servicing fluids that include an aqueous fluid containing a hydrophobically modified chitosan polymer, wherein said modified chitosan polymer is formed from the in-situ reaction of a chitosan

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polymer with an anhydride modifying compound, such as succinic anhydride, dodecynylsuccinic anhydride or any other alkenyl succinic anhydride having a C₂ to C₂₀ alkenyl chain. (Abstract; col. 3, line 65 to col. 4, line 6; col. 5, lines 33-65; col. 14, lines 48-67; Example 1)

Waggenpack further teaches that adding the modified chitosan water-soluble polymer increases the viscosity of the aqueous fracturing/servicing fluid, thus providing the fluid with enhanced low shear rate viscosity that is shear thinning. (Col. 1, lines 15-22 and 36-57; col. 3, lines 13-21)

Therefore, it would have been obvious to a person of ordinary skill in the art at the time that the invention was made to use the modified chitosan copolymer taught in Waggenpack as the hydrophobically modified hydrophilic polymer injected in Weaver's method of treating a subterranean formation. It would have been obvious for one skilled in the art to do so to attain a more cost-effective method by using a more viscous aqueous fluid having superior shear properties as taught by Waggenpack, and thus efficiently attain a desired level of surface permeability of the subterranean formation.

Thus, the claims are unpatentable over Weaver and Waggenpack.

Conclusion

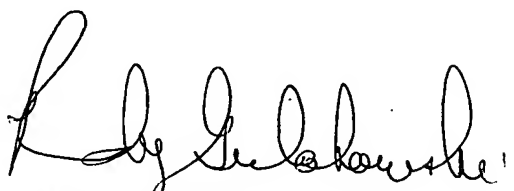
26. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The references listed on the attached PTO-892 form, although relevant, were not cited above because they were deemed cumulative.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Figueroa whose telephone number is (571) 272-8916. The examiner can normally be reached on Mon-Thurs & alt. Fri 8:00-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JJF/RAG



RANDY GULAKOWSKI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700